

## Official Travel Demand Model Guidance

Travel demand models (TDM) are tools that provide transportation planners or decision makers with information on the conditions of a transportation system during scenario analysis. NCDOT is the model custodian of numerous TDMs across the state of North Carolina with the exception of the three regional models which have a separate model custodian. All TDMs may have certain common elements, however each TDM is developed to capture the travel behavior characteristics unique to that region.

Once a TDM is developed it can go through different phases of future changes in the form of:

- **Administrative updates:** This refers to error correction, new changes or availability of new information. This update may or may not require a model recalibration. An example of an administrative update would be updating the model to agree with the most current STIP or MTP.
- **Technical updates:** This refers to TDM enhancements that require model recalibration.

TDMs go continuously through multiple administrative and/or technical updates contingent on the need. TDMs that go through updates often face the issue of version control and hence can create issues for the model user trying to use the correct version of the TDM.

The purpose of this document is to provide guidelines on:

- I. Which files make up the official model?
- II. Who is the model custodian?
- III. When is the model adopted/re-adopted?

This information will help the model user with information that can be used to track and locate the latest version of any TDM.

### 1. What is the official model and official model set?

The official model is the TDM that was adopted or endorsed by the respective board/TAC or executive committee. The model will include the Base Year (BY) and all Future Years (FY).

The official model set is a compilation of TDM associated files that will provide a potential user the ability to replicate the results of the official model at the time of its adoption. The “Official Model Set” must include all files and data that are required to successfully run the TDM and reproduce previously obtained results. Depending on the nature of the geographic area, there can be subtle differences in the official model sets. The geographic area can be broadly classified as 1) MPOs, and 2) non-MPOs. Below is a list of files that will be included in the official model set for each type of area.

#### **MPO Areas**

The “Official Model Set” will include the following files where relevant:

- Input files consisting of:

- i. The approved socio-economic data for base year (BY), interim year (if applicable) and future year (FY) data at the TAZ level that was used to develop the adopted Metropolitan Transportation Plan (MTP).
- ii. Network(s): Highway and transit networks and their attributes for base year, interim year (if applicable), and future year. Future year project analysis and the fiscally constrained MTP networks<sup>1</sup> must be included.
- iii. External station information for base year (BY), interim year (if applicable) and future year (FY) data.
- iv. TDM including parameters, coefficients, and GUI that are required to run the model.
  - The version of TransCAD used for the development of the model.
  - Other input files that are required to run the model (Special generator trip tables etc.)
  - Base Year outputs for replication purpose
  - Model user's guide, if available
  - Additional model documentation listing changes that have been made on current official model (for example, error correction) since last adoption/approval.
  - List of the projects or a PDF of the relevant STIP page(s) that includes the projects that were used in the MTP (*Note: The NCDOT MPO coordinator is expected to verify the consistency between the MTP and the projects included in the model*).

Additional documentation may be available. However, they are not required to run the model.

*Note: If other SE data assumptions are used during the development of a Traffic Forecast (TF), those assumptions should be clearly documented in the TF documentation.*

### **Non-MPO Areas**

The "Official Model Set" will include the following files where relevant:

- Input files consisting of:
  - i. The approved socio-economic data for base year (BY), interim year (if applicable) and future year (FY) data at the TAZ level that was used to develop the CTP.
  - ii. Network(s): Highway and transit networks and their attributes for base year, interim year (if applicable), and future year. For future project analysis, the Existing +Committed (E+C) network<sup>2</sup> must be included.
  - iii. External station information for the base year (BY), interim year (if applicable) and future year (FY).
  - iv. Other input files that are required to run the model (Special generator trip tables etc.)
- TDM including parameters, coefficients, and GUI that are required to run the model.
- The version of TransCAD used for the development of the model
- Base Year outputs for replication purpose

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<sup>1</sup> MTP networks are future year fiscally constrained networks used to evaluate MTPs.

<sup>2</sup> E+C is defined as all projects with Construction or ROW money allocated in the first five years of the current STIP at the time of development of the model.

- Model user's guide, if available
- Additional model documentation listing changes that have been made on current official model (for example, error correction) since last adoption/approval.
- List of the projects or a PDF of the relevant STIP page(s) that includes the projects that were used in the CTP.

## 2. Where is the official model set stored?

- For the three regional models, the official model is maintained by the regional model custodian. Their respective custodians:
  - i. Metrolina Regional Model (MRM): Charlotte Department of Transportation
  - ii. Piedmont Triad Regional Model (PTRM): Piedmont Authority for Regional Transportation (PART)
  - iii. Triangle Regional Model (TRM): Institute for Transportation Research and Education (ITRE)

- The NCDOT Model Research and Development Group is the model custodian for all other MPO and non-MPO travel demand models. These TDMs will be stored on the S: drive at:

[S:\Shared\TPB Reference\Official Travel Demand Models](#)

As the model custodian, the Model Research and Development Group has exclusive write access to this folder. For this reason, any model changes and updates should be coordinated with the Model Research and Development Group. The Group will save the updated model and relevant files to this folder.

Note: If the version of the model set that was used for the prior MTP or CTP update is needed, that is also available on the S: drive at: [S:\Shared-Read Only\Travel\\_Demand\\_Models](#). While this is **NOT** the official model set, it is an archived version of what was used during the last plan update and is often needed for specific purposes. Refer to the '*CTP Closeout Procedure*' for more information on how these files are saved.

## 3. Travel Demand Model Endorsement/Adoption

### 3.1 Who should endorse/adopt the travel demand model?

**MPO Area:** In an MPO the TAC board should endorse/adopt the travel demand model. Ideally this would come after a TCC recommendation

**Non-MPO Area:** Local officials should endorse/adopt use of the travel demand model for the planning process. The CTP Steering Committee can endorse/adopt if the authority has been delegated to the committee by local officials.

### 3.2 What does "endorsing/adopting the travel demand model" mean?

Endorsing/Adopting the travel demand model refers to the application and use of the travel demand model for planning studies in the modeled area. It is a policy decision that the model

will be used in the planning process. Planning studies that are supported by a travel demand model include but are not limited to:

- CTPs and MTPs;
- Traffic Forecasts;
- Traffic Estimates; and
- Other planning studies.

### 3.3 Why should a travel demand model be endorsed/adopted by local boards?

A travel demand model should be endorsed/adopted for numerous reasons. Among the reasons are:

- To reflect that there is agreement on the use, form, and content of the model
- To support development of plans such as CTPs or MTPs;
- To support project delivery efforts of NCDOT;
- To support consistent planning efforts;
- To support technical analysis and development of project proposals/recommendations;
- To ensure that there is only one official model at any given time; and
- To ensure that the latest planning assumptions are being used.

### 3.4 When should the travel demand model be endorsed/adopted initially?

A model should be endorsed/adopted before the development of the draft recommendations. The preferred time would be earlier in the process after the base year model is calibrated. A model shall be endorsed/adopted no later than concurrently with the MTP or CTP that was developed using the model.

### 3.5 When should the travel demand model be re-endorsed/re-adopted?

**MPO Area:** In an MPO area the following changes would require new endorsement/adoption:

- New socio-economic data control totals;
- New socio-economic data allocations;
- Off-cycle improvements to the model; or
- MTP or CTP plan updates on a standard schedule.
- If an MPO has its own separate guidance then for any reason that an MPO may list in that guidance

The following changes do not require re-endorsement/re-adoption:

- Technical corrections, defined in this document, made in the course of using the travel demand model;
- When the MTP is updated to reflect changes in the STIP; and
- Shifting of projects from one horizon year to another.

Before changes are made to a model, the Traffic Forecasting Group Supervisor should be notified so that potential impacts to forecast schedules can be determined.

MPO Boards may re-endorse/re-adopt beyond the minimums set in this guidance as they see fit.

**Non-MPO Area:** For locally desired CTP plan updates or improvement to model performance the model should be re-endorsed/re-adopted if recalibration is required. For use in other types of planning studies, any changes/corrections will be documented but re-endorsement/re-adoption is not required.

### 3.6 How Should Endorsement/Adoption Occur?

The endorsement/adoption of a travel demand model should be voted on explicitly by the appropriate group and noted in either meeting minutes or in a resolution. It is preferred that the endorsement/adoption of the travel demand model occurs as a separate item, but it may be included in a larger measure if it is explicit that the travel demand model is also being endorsed/adopted.

### 3.7 What are the benefits of endorsement/adoption of the model?

The endorsement/adoption of a travel demand model provides multiple benefits. Among the benefits are:

- Provides the board an opportunity to adopt a tool that will be used in all future planning studies giving the board more control;
- Provides better education and facilitates communication between the relevant groups through the endorsement/adoption process;
- Provides model users with a level of certainty to use the model by ensuring that only one official model exist at any given time;
- Provides an enhanced process of transition and training during staff turnover;
- Enhances record keeping; and
- May provide some further legal protection.

## ***Record of Revision***

The information contained in this procedure/ guidance is deemed accurate and complete when posted. Content may change at any time without notice. Neither the accuracy nor completeness of printed copies can be guaranteed. Please refer to the online procedure/ guidance for the most current version. Contact NCDOT's TPD Staff Engineer with questions about this procedure.

Version	Section Affected	Description	Effective Date
2.0	2	Added reference to CTP Closeout Procedure and archived CTP/MTP model set.	2/12/20

2.1	1; 3.5	Added a note that MPO coordinators need to verify the project in the network; Changed 'State Traffic Forecast Engineer' to 'Traffic Forecasting Group Supervisor'	3/6/2020